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PORTO RICO AGRICULTURAL EXPERIMENT STATION,

**D. W. MAY, Agronomist in Charge,
Mayaguez, P. R.**

CIRCULAR No. 19.

**Under the supervision of the STATES RELATIONS SERVICE,
Office of Experiment Stations, U. S. Department of Agriculture.**

**POULTRY KEEPING IN
PORTO RICO.**

BY

H. C. HENRICKSEN, Specialist in Farm Management.



Issued February, 1921



**WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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[Under the supervision of A. C. TRUE, Director, States Relations Service, United States Department of Agriculture.]

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POULTRY KEEPING IN PORTO RICO.

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INTRODUCTION.

The purpose of this circular is to outline in brief the essential facts concerning poultry raising in Porto Rico, and to give simple directions that will enable the average poultryman to obtain satisfactory results from his efforts.

In 1918 it was estimated that there were 1,000,000 fowls on the island. This is a very small number when one considers the important place poultry and eggs should occupy in the diet of the million and a quarter people in Porto Rico. That the supply is not equal to the demand is amply proved by the fact that both eggs and refrigerated poultry are imported at very high prices. In San Juan eggs weighing about $1\frac{3}{4}$ ounces brought 5 to 8 cents apiece retail during the past two years, while the price received for very poor fowls averaging $2\frac{1}{2}$ pounds was \$1.25 to \$2 each. It is true that the consumer in the city paid a price very different from that received by the producer in the country, but as marketing facilities continue to improve, poultry no doubt will become a means of increasing the revenue of the small farmer.

POULTRY ON THE FARM.

Those keeping poultry on the farm, or as a business conducted apart from that of farming, should bear in mind that the financial success of the undertaking depends upon (1) the keeper, (2) the bird. (3) the environment, and (4) the feed.

The keeper.—The woman of the house is usually in charge of the fowls on a farm, and the benefit to be derived from the poultry will largely depend upon whether she knows how to care for the fowls and whether she likes to do so.

The bird.—No amount of care will make a hen produce 150 eggs annually if she is but a 50-egg hen. In Porto Rico, as elsewhere, the profitable hen is the egg producer, not the heavy fowl which lays but

few eggs. It should be the aim of every poultry keeper to get a setting of eggs from hens that are known to be good layers. If such eggs can not be secured at once from improved breeds, selection should be made from the best hens in the keeper's own flock, or from the best available birds in the neighborhood. How to select the best birds will be explained later.

The environment.—The average farm offers ideal conditions for poultry raising. The fields teeming with insects, newly cultivated soil containing worms, and the grain fields and the stables, are surroundings which greatly supply feed for fowls. In addition, outdoor life, with its abundant fresh air and sunshine, offers ideal conditions which tend to make fowls healthy and productive. However, it is absolutely essential that sanitation, housing facilities, egg boxes, and the like, be given very careful attention.

Feed.—Fowls may find insects, worms, and some grain, any or all of which may or may not be plentiful. Nevertheless, the farmer's wife must as carefully plan to feed her chickens as she does her children, and she must plan to produce the feed on the farm. A prime requisite which must be kept constantly in mind is that a hen can not produce the maximum number of eggs unless she receives all the feed she needs. It is not profitable to buy feed for the common hen, as she does not lay eggs in sufficient number to pay for it. In other words, the common fowl may be profitable when fed on cheap home-grown feed, but only the improved fowl can be expected to produce a profit when fed the expensive imported mixtures.

THE COMMON FOWL OF PORTO RICO.

In all countries there are chickens that do not belong to any particular breed. Such chickens are usually found on farms where poultry is merely a by-product. With the more progressive methods of farming, however, the common chicken gradually disappears. In Porto Rico, where farming can not be classed as progressive, it is quite natural to find that most of the chickens belong to no particular breed. The ordinary farm chicken, while varying in size, color, and productiveness, is generally small, a poor layer, and produces eggs below the average size. Since, however, this is the type of chicken usually found in Porto Rico, poultry raisers must do what they can to improve their stock until it can be replaced with better.

THE EGG BREEDS.

All of the egg breeds are small, active birds, good foragers, and therefore well adapted to the farm. In proportion to the amount of food they consume, the small birds produce more eggs than the heavier breeds; furthermore, unlike the heavier breeds, they do not become fat and lazy when penned up. The egg breeds are nonsitters, though occasionally a hen will become broody for a few days. The

egg breeds have featherless shanks, a feature which makes them well adapted to muddy localities. These birds lay white-shelled eggs which are very large for small birds.

Most of the egg breeds originated in the Mediterranean countries, where the climate is subtropical. Among them are the Leghorn, the Minorca, the Ancona, the Andalusian, and the Spanish. Another breed, the Campine, originated in Belgium. As far as the climate is concerned, all these breeds are well adapted to conditions prevailing in Porto Rico, and all of them are much more profitable than the



FIG. 1.—Single Comb White Leghorn, male.

average native chicken. The actual value of one breed as compared with another can not be stated, as such valuation is not dependent upon the breed itself, but rather upon the development of strains within the breed. In fact, a high standard is obtained and maintained in any breed only by rigid selection and careful breeding.

VARIETIES.

Leghorn.—Of the several breeds above mentioned, the Leghorn is perhaps one of the best known. It is divided into varieties accord-

ing to the color of its feathers. These varieties are white, brown, buff, black, and silver. Also there are the single comb and double, or rose, comb varieties. All of the varieties are of the same size, the full-grown male weighing about $5\frac{1}{2}$ pounds and the female probably 4 pounds.



FIG. 2.—Single Comb White Leghorn, female.

The Single Comb White Leghorn has been bred to a very high stage of egg production (figs. 1 and 2). Theoretically speaking, any of the other colors are as desirable as the White Leghorn, but because more time, money, and energy have been expended in the development of this particular strain, it is one of the most highly bred birds in the chicken family. As to comb, there is no great difference. The single comb, however, is preferable in this climate.

Campine.—The Campine breed is also a very good egg producer. In many cases it equals and even surpasses the Leghorn, this depending, of course, upon the development of the strain from which the individuals come. The size is about the same as the Leghorn, the male



FIG. 3.—Silver Campine, male.

being usually one-half pound heavier. The two varieties are the Silver Campine (figs. 3 and 4) and the Golden Campine, the head and hackles of the former being white. The rest of the plumage is a greenish black, marked with white V-shaped bars. The Golden variety is the same, except that the white is replaced by golden bay.

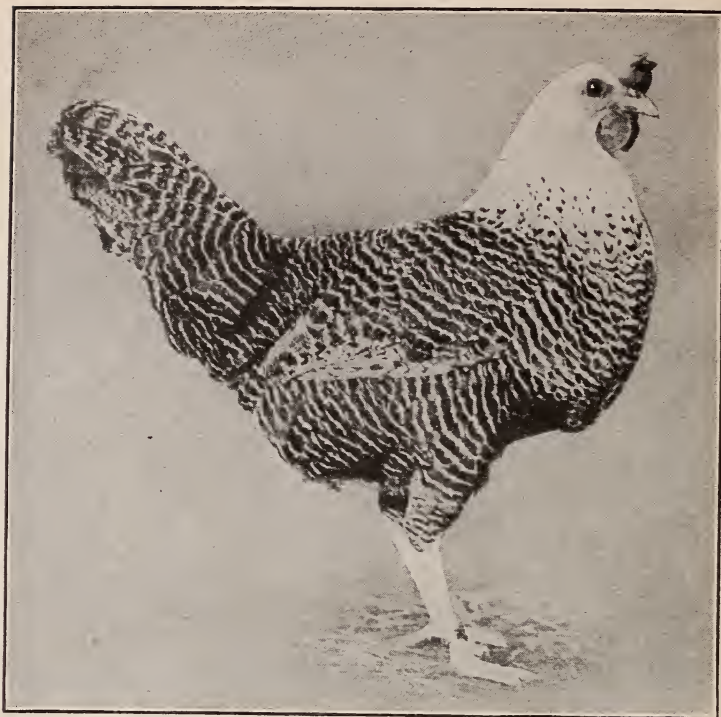


FIG. 4.—Silver Campine, female.



FIG. 5.—Single Comb Ancona, male.

Ancona.—This type of bird is very much like the Leghorn, the hen being about one-half pound heavier. The color is black, and some of the feathers are tipped with white in the form of a V. The two



FIG. 6.—Single Comb Ancona, female.

varieties, the single comb (figs. 5 and 6) and the rose comb, are identical, except for the shape of the comb. The Ancona is probably the third choice among the egg producers for Porto Rico.

Minorca.—The Minorca is a larger bird than those of the three former breeds. In color it is either a shiny black, pure white, or buff, and has a single, or rose, comb. The Single Comb Black Minorca is the best known of the varieties and probably the most



FIG. 7.—Single Comb Black Minorca, male.

highly developed (figs. 7 and 8). The standard weights of this variety are: Adult male, 9 pounds; female, $7\frac{1}{2}$ pounds. The Minorca has the advantage over the Leghorn, Campine, and Ancona in that it is larger and probably the most suitable for crossing with the common

hen of Porto Rico. On the other hand, it is a heavier eater and does not produce as many eggs as the lighter breeds, considering the amount of feed it consumes, although it produces a very large pure white egg.



FIG. 8.—Single Comb Black Minorca, female.

The other two breeds mentioned above, the Spanish and the Andalusian, are harder to procure and have no features which would serve as a basis for their recommendation.

GENERAL-PURPOSE BREEDS.

The breeds discussed so far are small in size but are good egg producers. Another kind of bird which is not profitable in Porto Rico and therefore not to be discussed here is the extremely large type which is kept especially as a meat producer. There is, however, an intermediate type of fairly good size, the hen and cock weighing respectively $6\frac{1}{2}$ to $7\frac{1}{2}$ and $8\frac{1}{2}$ to $9\frac{1}{2}$ pounds. The hens, while good layers, are not usually as good as those of the well-bred egg breeds.

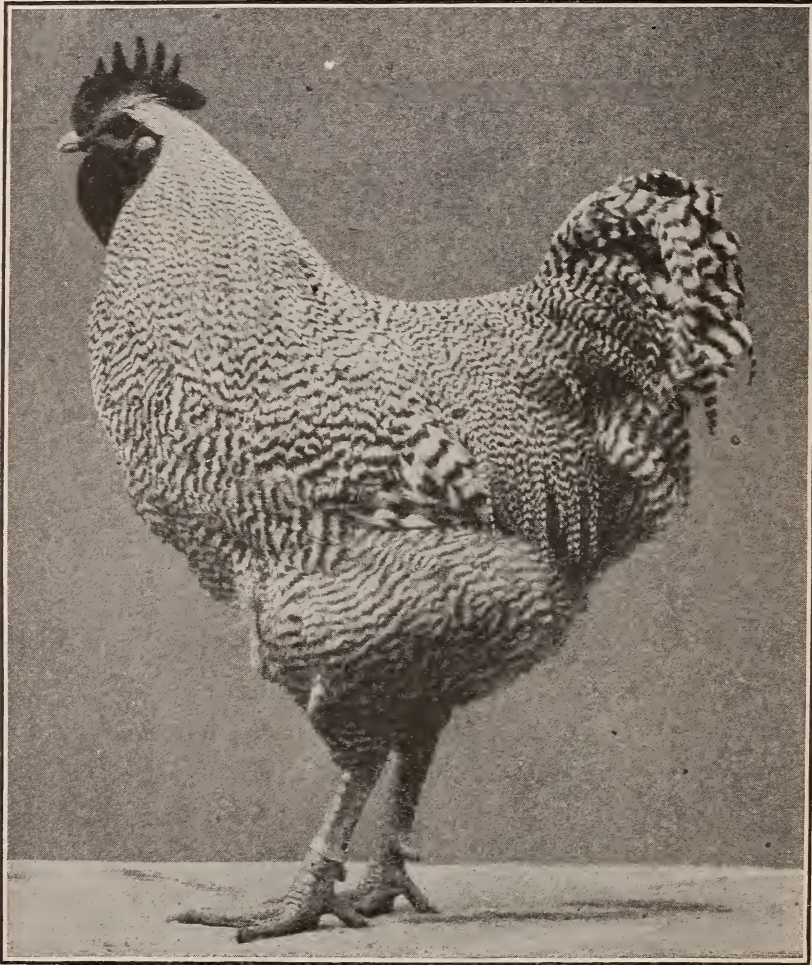


FIG. 9.—Barred Plymouth Rock, male.

The birds, in addition to being lazy, are heavier eaters than those of the egg breeds, and may become too fat and lay but few eggs. This, however, is not so likely to happen with free range on the farm as where they are penned up. Of this type Plymouth Rock, Rhode Island Red, and Wyandotte are the most important breeds in America. All three originated in the United States and are now

readily obtainable in Porto Rico. These breeds have smooth yellow shanks, a feature which, under Porto Rican conditions, makes them desirable. Their eggs are brown-shelled, and, in every respect, as good as those having a white shell.

VARIETIES.

Plymouth Rock.—The Plymouth Rock is the most popular farm bird in the States. The six varieties are practically identical in



FIG. 10.—Barred Plymouth Rock. female.

every respect except color. The Barred Plymouth Rock, which is the best known and probably the mostly highly developed of the varieties, has grayish-white feathers, each crossed by dark bars (figs. 9 and 10). In color it is similar to a type very frequently found in Porto Rico, but the two are not to be confused. The Porto Rican barred fowl is practically identical with a type of the common fowls in the States which belongs to a distinct breed called Dominique.

Rhode Island Red.—Of late years this has become popular as a farm fowl in the States (figs. 11 and 12). The two varieties, one



FIG. 11.—Single Comb Rhode Island Red, male.

a single, and the other a rose comb, are red in color, as the name (Rhode Island Red) indicates.



FIG. 12.—Rhode Island Red, female.

Wyandotte.—The Wyandotte is a well-developed breed divided into eight varieties, all having a rose comb and being alike, except in color. The white is the most popular variety, and for that reason perhaps the most highly developed (figs. 13 and 14). Other varieties are: Silver, golden, buff, partridge, silver penciled, Columbian, and black.



FIG. 13.—White Wyandotte, male.



FIG. 14.—White Wyandotte, female.

THE GAME.

The Game is a breed very well known in Porto Rico. It can not be recommended as a domestic fowl, as it is not so good an egg producer as the Plymouth Rock or birds of that type, and is kept in Porto Rico merely for cock fighting.

HOW TO IMPROVE BREEDING STOCKS.

Inasmuch as the average farmer does not keep poultry as his main business the problem for him to solve is how to improve his flock at least cost. There are three methods of procedure: (1) To buy a setting of eggs, (2) to buy a few hens and a cock, and (3) to buy a cock only. To buy a setting of eggs is usually the cheapest method. However, as eggs from very choice flocks are expensive the cost may be high, unless all the eggs hatch and no loss among the chicks is experienced. Eggs shipped from the States will hatch after arriving here, reports to the contrary notwithstanding, but the present mail facilities prevent shipment of young chicks. To buy a few 6-months-old pullets and a cock is a perfectly satisfactory but rather expensive method. Birds from highly developed strains are always expensive, but it is wiser to pay a high price for a few select birds than to buy a larger number that will prove undesirable. The same rule applies when buying a cock only. Such a bird, if obtained from a conscientious breeder, may be cheap at \$25, and if an individual can not afford to buy it a community or a poultry club may do so. A choice male when mated with a flock of 20 hens, selected from the very best obtainable in the neighborhood, will upgrade the stock in a very short time.

What breed to choose is so much of an individual question that it is difficult to give advice about selection. Undoubtedly on a poultry farm the most profitable bird is one of the egg breeds, since these are small and produce a large number of eggs in comparison with the little feed they consume. Feed is quite expensive in Porto Rico, and it pays to sell 9 eggs (1 pound) for 45 cents rather than live poultry at that price. On the average farm the heavier general-purpose breeds may be profitable, but even there the feed is by no means cheap. Moreover, the consumers are used to paying for poultry by the piece and not by weight. For this reason it will be more difficult, at least for some years, to sell the larger birds to good advantage.

As a rule the most practical method of improving the farm flock is to buy a purebred cock of a selected strain of one of the egg breeds and to mate him with 15 to 20 hens selected from the best native stock obtainable. Eggs from those pens should be the only

ones allowed to hatch, and from the progeny the most desirable hens should be selected. These hens should be mated with a fresh purebred cock, or exchanged with another poultry club. The principal fact to be borne in mind is that a purebred selected male should always be used, but never one that is either father or brother to the hens.

HOW TO SELECT BREEDERS.

As egg production is at present more profitable than meat production, the directions here given for selection of breeding stock are intended to enable the poultry raiser to secure the largest possible number of eggs from the hens of his flock. Selection is absolutely necessary regardless of the breed. Any strain quickly deteriorates without rigorous selection.

THE EGG TYPE.

The egg type is generally characterized by its long, graceful body. From the side, the neck and tail appear to be placed at an angle of 45° to the body. The back is long and straight. The breast is evenly curved from the head to the legs. The general appearance is graceful, never heavy or dumpy. The vigorous bird of any breed, and not the small, inactive one, should be selected.

HEAVY EATERS.

A hen of good egg type will produce eggs sufficient to pay for the feed she consumes; she must, however, be a hearty eater, else she will not produce the maximum number of eggs. A hen may be compared with a machine used for manufacturing eggs. She is fed well, and in return is expected to be capable of giving the largest number possible of eggs.

EARLY RISERS AND LATE RETIRERS.

In order to observe these points, one must "get up in the morning with the chickens." To know the worth of hens which are to be used for breeding purposes the caretaker or poultry manager must know all about them. Hens which go to roost early in the evening and stay until late in the morning are not desirable types. The hen that fills the egg basket is the early riser and late retiree.

HEAVY PRODUCERS.

Production is the real test. A hen may be of the egg type, she may be large and vigorous, she may be a heavy eater and an early riser, and yet she may not fill the egg basket. Where there are large

flocks of chickens it is impossible to determine the individual production of eggs unless one uses trap nests. On the farm, however, it is not an uncommon thing for the housewife and the children to know what the hens are doing.

PERSISTENT LAYERS.

The good egg producer is the hen that lays persistently and frequently. The hen that has frequent or long-continued nonlaying periods is not the one producing 200 eggs a year. There are hens which produce as high as 300 eggs a year. Inasmuch as a hen can not produce eggs and feathers at the same time, it is reasonable to conclude that the heavy producer has a short molting season; or, in other words, she starts to lay early in the season and keeps on until late. The hen producing eggs when eggs are high in price is, of course, the most profitable.

MATURE BIRDS.

Mature birds are the only ones from which to select. Pullet eggs should never be used for hatching. The value of a hen can not be determined until she has been under observation for a long time. A pullet hatched early in the spring should begin to lay eggs in the fall. In that case she can be carefully watched until the next fall, when she begins to molt, and the spring after that, when she begins to lay again. If she ranks high in all the points discussed above, it is quite certain that her eggs will be superior to the average for setting. A keeper should not be discouraged if he finds but one hen in a whole flock, or even in a whole community, that grades high in all or most of the points mentioned. By hatching a few dozen eggs from that particular hen mated to a purebred cock, the keeper may expect in a few years a strain of chickens that will produce many more eggs than he now gets.

THE MALE BIRD.

The male bird should also be selected, whether it is purebred or mongrel. While it does not pay to use a mongrel male for breeding, this bird should, if used, be selected for egg type characteristics, the same as the hen. Under no consideration should a cock be used for breeding unless hatched from an egg laid by a selected hen. Where the flock is large an extra cock may be kept as a reserve, but otherwise all cockerels should be disposed of in the fall. It is a financial loss to keep them longer, as they have no influence upon the hens in regard to the number of eggs produced. The hens will lay as many eggs without the males, and the eggs will be of better keeping quality. The latter is of greater importance in Porto Rico than is generally realized. Eggs that are not fertilized will keep

fresh for several weeks if kept in a clean, dry, and moderately cool place. Unfertilized eggs will also keep much longer than the fertile ones when a preservative is used.

KEEP YOUNG BIRDS ONLY.

A pullet hatched in April will usually begin to lay in November and continue laying through the winter. Next fall she will go through her first molt, and begin laying again sometime during the winter. The following fall—that is, when she is $2\frac{1}{2}$ years old—she should be disposed of. Many poultry keepers in the States dispose of the hens the second fall; that is, when they are $1\frac{1}{2}$ years old. This, however, is not practicable on the farm. On the other hand, it is unprofitable to keep hens after they attain the age of $2\frac{1}{2}$ years. That rule does not apply to breeders of course. They are frequently not selected until in the third year, and they may be kept for several years if their progeny is satisfactory.

SANITATION.

On the farm sanitation means ordinary cleanliness; that is, clean drinking water, clean roosting places, and clean nest boxes. The roosting places should be cleaned and thoroughly whitewashed with lime every month. The nest boxes should be cleaned and the contents burned. It is good practice to hold the box over a fire so as to scorch the inside and thus kill germs and insects. In Porto Rico, where tobacco stems and waste from tobacco factories can be obtained cheaply everywhere, there is no reason for letting the poultry suffer from insects. Tobacco stems should be substituted for straw in the nest boxes, and tobacco dust should prove as good an insect powder as can be bought anywhere. Nothing is better than grease containing a few drops of kerosene to drive fleas from the heads of chickens. Carbolineum, or crude petroleum, thoroughly applied to the roosts, the interior of the chicken houses, and to the nest boxes, is an effective treatment for mites and ticks.

In the commercial poultry yard sanitation is the all-important problem. Undoubtedly most of the failures in Porto Rico can be traced directly to improper sanitation. The temptation seems to be to keep too many birds in one inclosure, or in several adjoining inclosures. This is a very dangerous and an unwise practice unless conditions are favorable and great precautions are taken. In the first place, the yard should be well drained, and the land made to slope so that the water will run off quickly. The fence should be of wire, not boards, and the fence posts should be of cement. The house should preferably be constructed of cement posts, with cement floors and galvanized-iron roofing. In addition, the house and yard should be shaded by rather large trees. Where several pens are close

together they should be so located that water from one can not drain into another.

All pens must be carefully cleaned every week. The manure should be swept up and removed. The posts, roosts, etc., should be sprayed with a lime whitewash, and the ground should be well sprinkled with powdered lime. A sick bird should be promptly removed to an isolated pen, and a dead one should be immediately burned. In case of an epidemic the birds should be removed, each pen separately, to some new location, and their old pens should be disinfected with crude carbolic acid or some other strong disinfectant.

FEEDS AND FEEDING.

Most people keep poultry for the profits accruing therefrom. In calculating that profit on the farm, charge for caretaking is seldom considered. Therefore, consideration is given the cost of the feed only—that is, the feed actually supplied—and, in some cases, the cost of crops destroyed by the chickens. On the other side of the account are the eggs and the meat, and the difference between the two items is the gain or loss.

In the States a heavy bird such as the Plymouth Rock consumes from 80 to 100 pounds of grain per year when penned up. The egg breeds consume less, and especially so in this warm climate. On the farm the feed bill is not usually high because fowls pick up considerable in the field, and the feed supplied, if produced on the farm, is often such as would not bring much money when sold. There are two general classes of feed, one containing principally starch, such as corn and root crops, and the other, containing a large proportion of protein, includes beans and other leguminous seeds, as well as meat and fish scraps. Both of these classes of feed are necessary for poultry, and both should be produced on the farm. One of the cheapest protein feeds is the pigeon pea, which can be produced anywhere in Porto Rico. It can be planted in the fence rows and in odd corners, and chickens will do the harvesting. Any of the legumes, such as peas and beans that have been injured by rain and can not be cured, will serve for chicken feed. Offal from slaughterhouses is excellent, and fish scrap is also good as feed, but it should be fed sparingly or it will cause the eggs to have a fishy taste. In breeding pens where the eggs are used exclusively for hatching, the hens may be fed generously with fish. Fish or meat when fed to hens will start them laying, and tends to produce more eggs than other classes of feed. The egg is one of the most concentrated of protein foods, and no hen can produce the maximum amount of eggs without plenty of beans, peas, or animal matter. Corn is a good feed, but it produces fat when fed in large quantities. Root crops, which may

be fed raw or boiled, are excellent when fed together with protein feed of some kind.

The whole secret of obtaining profitable results is to supply much protein feed, and to mix it with other feeds so that the hens will like it and eat much of it. A good hen will pay handsomely for all the feed she eats. A 150-egg hen, with eggs at $2\frac{1}{2}$ cents apiece on the farm, produces \$3.75 per year. Even if she consumes a dollar's worth of feed, she brings a good profit.

LITERATURE.

Those interested in this subject may find much information of value in any of the following Farmers' Bulletins:¹

- 287. Poultry Management.
- 357. Methods of Poultry Management at the Maine Agricultural Experiment Station.
- 528. Hints to Poultry Raisers.
- 530. Important Poultry Diseases.
- 624. Natural and Artificial Brooding of Chickens.
- 682. A Simple Trap Nest for Poultry.
- 801. Mites and Lice on Poultry.
- 806. Standard Varieties of Chickens. I. The American Class.
- 897. Fleas and their Control.
- 898. Standard Varieties of Chickens. II. The Mediterranean Class.
- 1070. The Fowl Tick.

¹ Copies of these bulletins may be obtained free on application to the Division of Publications, United States Department of Agriculture.



